



THE COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION
100 CAMBRIDGE STREET, BOSTON MA 02114

Meeting Minutes for August 10, 2006

Minutes approved October 12, 2006

Members in Attendance:

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| Vandana Rao | Designee, EOEa |
| Bill Reyelt | Designee, DHCD |
| Jonathan Yeo | Designee, DCR |
| Mary Griffin | Designee, DEP |
| Gerard Kennedy | Designee, DAR |
| Mark Tisa | Designee, DFG |
| Joseph E. Pelczarski | Designee, CZM |
| Scott Horsley | Public Member |
| John LeBeaux | Public Member |
| David Rich | Public Member |

Others in Attendance:

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| Linda Hutchins | DCR |
| Michele Drury | DCR |
| Sara Cohen | DCR |
| Becky Saggese | DCR |
| Bruce Hansen | DCR |
| Peter Weiskel | USGS |
| Stacey Archfield | USGS |
| Dennis Fantone | State House News Service |
| Tom Lamonte | DEP |
| Kerry Mackin | Ipswich River Watershed Association |
| David Hale | Omni Properties |
| William Murray | PLACES Site Consultants (Proponent's Representative) |
| Margaret Callanan | EOEA |
| Daniel Lorch | EOEA (intern) |
| Paul Lauenstein | WSCAC/Neponset River Watershed Association |
| Margaret Kearns | DFG/Riverways |
| Mettie Whipple | Eel River Watershed Association |
| Katlyn Stillings | Camp Dresser & McKee |
| Jill Cowie | Watershed Action Alliance of SE MA |
| Marilyn McCrory | CZM |
| Peter Shelley | Conservation Law Foundation |
| John Bassett | Rockport |
| Christina Wolfe | Rockport |
| Samantha Woods | North & South Rivers Watershed Association |

Agenda Item #1: Executive Director's Report

Jonathan Yeo announced that he had been asked to chair the meeting in Kathy Baskin's absence. He introduced and welcomed Erin Graham, a new Environmental Engineer in the Office of Water Resources.

Hansen provided an update on the hydrologic conditions:

- July precipitation was generally slightly below normal. The statewide average precipitation was about 84% of normal. Precipitation ranged between 123% of normal in the Northeast region to 61% of normal in the Southeast region.
- July streamflows were above normal and normal statewide.
- July groundwater levels were above normal and normal. Record high water levels for July were observed in 23 wells.
- Reservoir levels were all normal or above.
- Fire danger was high in the last part of July and early August. It was highest in the Cape Cod and Southeast regions.
- Drought indexes show that there is little chance for drought in Massachusetts until the end of October.
- Weather conditions: Cold fronts, precipitation and cooler weather are predicted; one period of abnormally high rainfall is projected for a period two weeks hence.

Agenda Item #2: Vote on Request for a Determination of Insignificance under the Interbasin Transfer Act for Woodlands at Laurel Hill, Westford and Acton

Drury introduced the proponent's representatives. Drury provided background on the project, a Chapter 40B development that straddles Acton and Westford. The proposed development is in the Concord River Basin and includes portions of the Towns of Westford, Acton and Boxborough. The design incorporates sustainable development principles and low-impact development techniques.

The Acton Water District will serve the Acton and Boxborough portion, but, by statute, cannot serve the Westford portion. It is not economically feasible for Westford to supply water; therefore, Littleton has agreed to supply water to the Westford portion from sources in the Merrimack River Basin. Wastewater will be discharged to the Concord River Basin. Hansen presented the proponent's analysis of streamflows. He noted that the development will produce a minor difference in flow patterns (less than 5%), meeting the criteria for insignificance. No significant environmental impacts were identified. Staff recommended that WRC approve the determination of insignificance.

Tisa asked for clarification on the low-impact development techniques proposed. Were the landscaping techniques incorporated into the design? Bill Murray, the proponent's representative, responded that the WRC's lawn and landscape standards were incorporated, but not rain gardens. The proponent is mostly incorporating conservation approaches – including moisture meters, rain sensors on irrigation systems, and standard water conservation techniques for buildings – and is recharging to wetlands in accordance with the Wetlands Protection Act standard for recharge in proximity to wetlands.

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| V O T E | <p>A motion was made by Horsley with a second by LeBeaux to find the transfer of water supply from the Littleton Water Dept. to the Woodlands at Laurel Hill Development, as proposed, is insignificant to the Interbasin Transfer Act.</p> <p>The vote to approve was unanimous of those present.</p> |
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Agenda Item #3: Presentation: Sustainable Yield Estimator Project

Weiskel of USGS made a presentation on the sustainable yield estimator, a project started about six months ago in cooperation with DEP. The objectives are to develop and validate a screening-level tool to assess the effects of existing and proposed withdrawal permits and discharges at any location on a perennial stream in Massachusetts. The approach encompasses two aspects.

(1) Estimating the streamflow hydrograph. USGS will use a more detailed approach to generate a complete streamflow hydrograph at ungaged sites under both natural and regulated (existing withdrawals and wastewater returns) conditions superimposed on the basin.

(2) Creating digital atlases of water availability and use.

A beta version will be available in September 2007. Documentation of the methodology will be completed in late Fall 2007, and publication of the Hydrologic Atlases in digital form will occur by September 2008. Weiskel defined “sustainable yield” as the maximum net withdrawal (withdrawal less return flows) that does not result in streamflows less than a specified minimum over some period of interest at the outlet of the basin of interest.

The work will be based on data from gages at 66 sites and on a USGS report currently being developed on flow regimes at these minimally altered sites. Some of these basins extend beyond Massachusetts boundaries.

Weiskel described the process used to generate natural and regulated streamflows. The user selects a location of interest through a point-and-click map interface. The application computes a natural flow regime (i.e., the complete hydrograph) for a period of record that the user specifies. Then the user assigns a streamflow target (e.g., a percentage of monthly flow, or a month-by-month target). The user can then edit the existing Water Management Act withdrawals or return flows or add new ones. Then the application will compute regulated flow regimes, superimposing these on the natural regimes. The difference between the two is the “sustainable yield” target. The loop can be repeated to test alternatives. The audience for the tool is the DEP Water Management Act staff. The application is intended as a tool to help staff meet their mandate to protect the environment.

Weiskel then provided a technical explanation for how the natural flow hydrograph is estimated. Two regression-based methods are being tested. Both relate basin characteristics (basin area, surficial geology, slope, percent surface water, and other physical characteristics) at gaged sites to various components of the flow hydrograph at the gage. Equations are then used at ungaged sites to predict the corresponding flow from these basin characteristics. This application goes

beyond the USGS application StreamStats. The new application allows the construction of actual flow hydrographs through reference to an index gage.

Sustainable yield is a function of what needs to be left in the stream, as determined by the user – e.g., a percent of index streamflows or other targets. Weiskel demonstrated some of the features of the application. A custom feature allows the user to specify the amount of water to be left in the stream, month by month. The user can adjust the amount of withdrawals and returns. Preset values will be based on DEP's annual data disaggregated to the monthly level based on detailed information on monthly flows from about 50 towns. USGS is working closely with the EOE Water Budgets project on all water-use aspects of this program.

The next step is to look at the regulated flow regime in relation to instream-flow targets. The advantage of the new application is that it will use an index gage that is near the user's ungaged site and that is similar in characteristics. The methodology will be tested in several ways.

In summary, this application:

- Allows a natural flow regime (complete hydrograph) to be obtained for any site on a perennial stream in Massachusetts
- Looks at the impact of the stressed-flow regime after accounting for withdrawals and discharges
- Allows a user to specify streamflow targets and estimate sustainable yields consistent with that target for any time period, on a continuous, month-by-month, or seasonal basis
- Performs iterative adjustments to see what the effects are
- Improves estimates of water availability and streamflow statewide

Horsley asked if vegetation was considered in basin characteristics. Weiskel explained that land use and land cover are not being dealt with explicitly in this version. All of the natural-flow gage sites are "unimpacted" (forest cover predominates). Future versions will be more explicit about the effects of land-use change. In the SuAsCo Basin, land-use impacts will be addressed separately from withdrawals because USGS has a hydrologic model that enables USGS to do this.

Horsley then asked if the application would be limited to Water Management Act withdrawals or would include such things as domestic wells. Answer: the application will address WMA withdrawals, NPDES returns, and all public water supplies, except transient/noncommunity withdrawals. Thus the application should be used with caution in communities with high consumptive losses from private wells and private irrigation.

Horsley asked Weiskel's opinion on how representative the index streams are of natural conditions, if that is what the application is being calibrated to. Horsley questioned whether there really are any unimpacted, natural flow systems that can be used as controls. Answer: these are relatively unimpacted gages. USGS and DCR are looking at this in a current study, which will evaluate the degree of impact at each of the index gages.

Weiskel explained the peer review process, in response to a question from Griffin. The project has generated much interest around the country and will receive a great deal of scrutiny. The

project chief is Stacey Archfield. A significant part of this work is being done as part of her doctoral dissertation with Prof. Richard Vogel at Tufts University.

Rich presented a concern that the application considers the surficial area of sand and gravel in a drainage basin rather than incorporating aquifer thickness by use of aquifer transmissivity, and DEP's subsequent use of this information in permitting. Weiskel felt that it was fairly well established that percent sand and gravel can be correlated to flow characteristics and is an important factor in predicting flows at ungaged locations. The regression estimates will have error bars around them to characterize the degree of uncertainty or "noise" within the estimates. Weiskel reiterated that the tool is a screening-level tool for permitting at the basin scale.

Tom Lamonte described how DEP envisions using the tool as part of the WMA. This is not a definitive tool, but a screening tool that allows the user to look at (1) what may be expected for natural flows; (2) what may be expected for present-day flows, given current data on withdrawals and discharges; and (3) what would be a balance between human needs and environmental needs. DEP envisions this as a first step that would become more sophisticated in the future.

Rich expressed concern that the sustainable yield estimator might be used prior to on-site work to regulate development of public water supply sites. This may restrict suppliers from doing on-site work. Rich wants to allow suppliers to do the on-site work, despite indications from the estimator that the site might not be developable.

Lamonte responded that this is a screening tool that may be used to highlight impacts that may need to be considered. The tool is a way for the water management program to integrate DCR's work on index flows into the mix.

Horsley asked Lamonte how sustainable yields will be defined, that is, how much below the natural flow will be acceptable? What will the acceptable levels be? Lamonte responded that DEP first needs to work with and validate the tool to evaluate the information it will provide. He did not envision that DEP would be shutting off existing wells (which are the greatest problem), but rather anticipates that DEP will be looking to mitigate impacts identified by the model.

Weiskel noted a concurrent project that USGS has proposed, at DCR's request, to look at the relationship between fish community composition at 1,000 sites that Fish & Game has sampled and basin characteristics, including both land use and flow characteristics. The project will shed light on the percentage changes in flow statistics and which of these are, in fact, thresholds to protect fish community integrity.

Kerry Mackin asked if Weiskel's Powerpoint presentation could be made available on-line. Answer: If DEP approves, yes. Mackin pointed out that the tool does not appear to incorporate very localized impacts, such as induced infiltration. Weiskel responded that the effects of a pumping well on streamflow are not instantaneous. USGS is using a "Stream Deplete" algorithm (used in Ipswich River Basin modeling) to simulate impacts using that lag time.

Mackin supported this effort and asked about the timing of the anticipated release of the tool and the date for WMA registration renewal (January 1, 2008). She asked if the tool could be available to evaluate the impacts of registered withdrawals on streamflow and to influence registration renewals. Lamonte responded that the tool was not designed to address the registration renewals and reiterated that the application is a screening tool. Future versions of the tool are expected.

Whipple asked about water withdrawals in Plymouth. Weiskel responded that the Plymouth-Carver area and the Cape Cod and the Islands region will be incorporated into the application in a different way, using groundwater models. Results of recent studies in these areas will be used to simulate natural flows at the mouths of the perennial streams.

Pelczarski asked about the applicability of the model in coastal tidal areas. Weiskel replied that the head of tide in rivers will be the limit of the application's capability.

Cohen asked about the definitions of "sustainable yield" and "maximum net withdrawal" and said the results of the analysis could be misinterpreted to indicate that water is available in a stream in a particular month. Weiskel agreed that the issue was complicated and needs further discussion.

Agenda Item #4: Presentation: Dam Removal Permit Streamlining

Vandana Rao described the process EOEa has initiated to facilitate dam removal. As background, she said there are 3,000 dams in Massachusetts in the dam database, plus additional smaller dams. Many do not function as initially intended or are dilapidated. Ownership of many is questionable. In short, many are serving no purpose, blocking streamflow, fish passage, and river continuity, and creating negative ecological impacts.

Dam removal to restore habitat was one of the recommendations of the 2004 Water Policy. The Taunton dam emergency in October 2005 elevated the issue, and the Secretary requested an investigation of ways to streamline the permitting process. A Work Group consisting of state and federal agencies, nonprofit organizations, and consultants was created. Products, still in development, will include a policy statement from the Secretary, a Memorandum of Understanding among the agencies involved, simple guidelines for dam removal and a checklist, and recommendations of the Work Group. The latter could include a point of contact in one of the EOEa agencies, formation of a dam decommissioning committee (such as is used in New Hampshire), and provision of training. The streamlined process will be piloted on a few state-owned dams in different parts of the state. The work products will be brought to the commission in September and October.

Samantha Woods asked if any incentives would be provided for private dam owners to remove dams. In response, Rao discussed outreach to the Conservation Commissions and the experience of some other states. The focus of the Work Group is on streamlining the dam-removal process. The process will not review and prioritize dam removals.

Yeo asked who would determine if the ecological benefits of removal would outweigh the benefits of leaving the dam in place. Rao responded that the existing permits (Wetlands Protection Act, Endangered Species, etc.) would still govern.

LeBeaux asked how the responsible party for dam removal would be identified. Rao responded that the property title would reference the presence of the dam. Yeo added that DCR Office of Dam Safety has just completed a title search of all dams, and that there are only a few “orphans.”

Rao concluded by saying that there are various sources of funding to assist dam owners who wish to remove dams. A state coordinator may help owners identify funding assistance.

Additional Agenda Item: Public Health Emergency Related to EEE

Gerard Kennedy provided an update on the public health emergency declaration related to the presence of Eastern Equine Encephalitis (EEE) and the decision to do aerial spraying. Several factors influenced the decision to spray, including elevated numbers of infected mosquitoes and the discovery of an infected horse. In addition, EEE manifests itself in three-year cycles, and this is the third year in which infections have occurred; last year, two human deaths occurred. Finally, infected mosquitoes have been identified early in the season.

The pesticide of choice was Anvil, which has very little toxicity to humans; however, it is very toxic in the aquatic environment. The application rate was extremely low. Exclusion zones were downloaded into the navigational software for the aircraft. Buffer zones included fish hatcheries, certified organic farms, certain priority habitat areas identified by the Natural Heritage Program, and drinking water reservoirs and tributaries identified by DEP.

Monitoring included surface water monitoring and sampling by cranberry growers and by all public water suppliers.

Kennedy said that elevated EEE levels are still being observed outside of the area sprayed. In addition, there is some concern about exposure that may have occurred before spraying took place.

Horsley asked if the planes were monitored, and if the pilots were certified pesticide applicators. Kennedy confirmed the latter. Griffin said that the planes are guided by computer. Kennedy indicated that the conditions for spraying, with low wind speeds, were ideal.

Lauenstein asked what the incubation period for EEE is and if there is any correlation between habitat and the presence of EEE. Kennedy said the incubation period is about 10 days and explained that the virus affects bugs and birds that inhabit freshwater swamps. Mosquitoes then bite the birds and then humans. Some of the areas that were excluded are also areas that are good breeding habitat for mosquitoes. Kennedy said the area sprayed started in the southern part of Duxbury and went to New Bedford and through Carver and Plymouth and Raynham.

In response to a question from the audience, Kennedy further stated that he presumed the monitoring results and plans for any additional spraying should be publicly available information. Another comment from the audience indicated that two days' notice did not allow

the public much time to research and respond to this action. The authorities were urged to involve the public, including watershed groups and environmental organizations, in the decision-making and notification process.

Kennedy speculated that, depending on conditions, another arbovirus (such as West Nile virus) might be an issue next year.

Rao asked how non-sprayed areas are being handled and noted that some of the wetlands that were not sprayed are mosquito breeding grounds. Are there any alternative treatments that may be effective in these areas such as pheromones? Kennedy responded that there is a great deal of resistance to spraying those areas that were excluded in the last round of treatment. Larvicide treatments are ongoing.

Other Business

Mackin inquired whether the WRC would discuss updates on Reading. Yeo responded that this would likely be a topic on next month's agenda for the WRC.

Meeting adjourned